IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/064,731
Filing Date:	August 12, 2002
Applicant:	Francois Charette et al.
Group Art Unit:	2857
Examiner:	Charioui, Mohamed
Title:	METHOD AND APPARATUS FOR OBJECTIVE MEASUREMENT OF NOISE

REPLY BRIEF PURSUANT TO 37 C.F.R. §41.41

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Examiner's Answer mailed April 2, 2007, Appellants, Francois Charette et al. file this Reply Brief, which is due by June 2, 2007.

Argument.

Applicants respectfully point to several errors in the Examiner's Answer. First, the examiner maintains that Rayment '298 teaches establishing a threshold metric. (Examiner's Answer, pp. 3.) While Rayment '298 discloses establishing a set of stored data that indicates the likely source of a noise occurring at a specific vehicle vibration frequency it does not establish a threshold metric based on a sound level. This element is not present in Rayment '298 nor has the Examiner cited to any portion of Rayment

'298 disclosing a threshold metric based on a sound level. To the extent a threshold metric exists in Rayment '298, it is based on the frequency that the vehicle is subjected to, not the sound or noise level resulting from vibrating the vehicle through predetermined range of frequencies. Second, while the Examiner acknowledges that Rayment '298 fails to teach measuring the sound level emitted from the product the examiner's reliance on Uhlig '036 as teaching this feature is not supported by the disclosure of Uhlig '036. Uhlig '036 as set forth below and contrary to the examiner's position, does not disclose measuring the sound or noise level when vibrating the vehicle through a predetermined range of frequencies.

A1. The examiner's states that "Rayment '298 identifies vibration induced vehicle noises by determining the frequency of the vibration induced vehicle noise," (Examiner's Answer, pp. 5.) This is incorrect, as previously pointed out by applicants, Rayment '298 compares the "frequency at which a vibration induced noise occurs with a set of stored data to identify the source of the vibration induced noise." (Col. 1, ll. 54-58.) Rayment '298 does not determine the frequency of the vibration induced noise, it discloses monitoring the vehicle vibration frequency at which the noise occurs and when it stops. Rayment '298 discloses vibrating the vehicle over a range of frequencies, wherein the particular frequency measured is the frequency of operation of the vibration generator, not that of the noise. Further, Rayment '298 is only concerned with determining when the noise begins and ends; it does not disclose measuring sound levels. Rayment '298 provides no disclosure relating to the strength or loudness of the sound, nor does it discuss measuring the strength or loudness of the sound. Thus, and contrary to the statement made by the examiner, Rayment '298 simply receives an input

relating to "when a vibration induced noise occurs on the vehicle," and does not determine the frequency of the vibration induced vehicle noise nor does it determine the strength or loudness of the vibration induced noise.

Turning to the next statement made by the examiner, "[t]he Examiner also sees that it is well-known in the art to determine the noise or sound level when having the frequency of the noise or the sound. Therefore, the Examiner introduced Uhlig to show that sound level can be determined from the frequency (see col. 4, lines 4-34)." Applicants are unsure what this statement means. Specifically, does this mean that for a given noise or sound the examiner can once the frequency of the noise or sound is known determine the sound level. First, Rayment '298 does not determine the frequency of the noise or sound, instead it takes note of the frequency of vehicle vibration at which the noise or sound occurs. Applicants submit that simply knowing the frequency of a sound signal does not enable one to determine its level, nor does knowing the frequency at which the vehicle is vibrated enable one to determine the sound or noise level.

Second, the citation to Uhlig '063 does not support the second portion of the Examiner's statement. Uhlig '063 uses an exciter coil 46 to induce vibrations in the rotor 12. A microphone measures the sound or vibration level emitted by the rotor and provides a measure of the sound level to a measuring amplifier. (Col. 4, ll. 4-7.) The output of the measuring amplifier is observed as the frequency of the waveform generator is varied. (Col. 4, ll. 10-12.) Again, it is not the frequency of the emitted noise or sound being monitored. Once a peak or resonant frequency output signal is received, the frequency readout of the waveform generator 56 is noted. (Col. 4, ll. 12-

15.) Accordingly, Uhlig '036 discloses varying the frequency of the waveform generator 56 until a peak or resonant frequency is received and transmitted by the microphone 54. The examiner has not cited any disclosure of Uhlig '063 to support the statement that the sound level is determined from the frequency. At best, Uhlig '063 discloses using a waveform generator 56 to produce a peak output amplitude measured by the measuring amplifier 64, with a power amplifier 60 adjusted to produce a predetermined measured output voltage from the microphone 54. (Col. 4, ll. 18-23.) Accordingly, Uhlig '063 does not measure the sound level emitted from the product, but instead excites or uses an exciter coil and waveform generator to produce a peak or resonant frequency.

The examiner maintains that the support or apparent reason for combining Rayment '298 and Uhlig '063 is that "Rayment compares the frequency of the noise with the stored frequencies a which known vibration induced noises have been found in the past to identify the vibration induced noises on vehicles." (Examiner's Answer, pp. 6.) Applicants disagree and point to the specific sections of Rayment '298 cited by the examiner which disclose vibrating the vehicle at a range of different frequencies. (Col. 2, ll. 44-45.) Rayment '298 notes the vehicle vibration frequencies at which vibration induced noise appears and the different frequency at which it disappears. By comparing these two noted frequencies with stored data representing frequencies at which known vibration induced noises occur one is able to identify the source of vibration-induced noises. Once again, Rayment '298 does not measure sound levels as claimed by applicants. Further, and contrary to the examiner's statement, Rayment '298 does not measure the frequency of the noise, Rayment '298 records the frequency of the vibration generator used to vibrate the vehicle.

Uhlig '036 does not determine a threshold metric based on a sound level nor does it measure the sound level emitted from a product and use this value to generate an objective metric and then compare the objective metric with the threshold metric. As set forth above, Uhlig '036 uses the microphone to ascertain when a peak or resonant frequency output signal has been received. Uhlig '036 adjusts a power amplifier 62 to produce a predetermined measured output voltage from the microphone 54 in order to have a standard value to measure decay rates.

Regarding the examiner's statement that Rayment '298 "teaches calculating the percentages for indication of the likelihood of what causes the particular sound or noise...." What "percentages" is the examiner referring to? The percentages set forth in Rayment '298 deal with a mean value and a range value, where the mean is the average of the lower and higher frequency values and the range is the difference between low and high frequency values. (Col. 5, ll. 1-4.) Rayment '298 discloses that these values are then compared with previously measured data to obtain a percentage. (Col. 5, ll. 4-13.) The examiner apparently believes that because Rayment '298 uses a percentage calculation with respect to mean frequency and frequency range distribution to ascertain a fit with previously measured data (Col. 5, ll. 6-9.) and that the N10 loudness scale uses a percentile statistical measure that a person of ordinary skill in the art would somehow use the N10 scale to determine or identify the vibration-induced noise. Applicants submit the examiner has provided no apparent reason for such a combination, especially when neither Rayment '298 nor Uhlig '063 are concerned with the specific measured sound level emanating from a product during the use thereof.

A2. "The examiner considers the stored data to be the data of the product that meets allowable noise level standards, since one of ordinary skill in the art can build up a set of stored data that would be used to determine the source of the occurring noise in a tested product (see Rayment, col. 1, lines 62-67)." (Examiner's Answer, pp. 7.) Applicants do not disagree that Rayment '298 uses a set of stored data or a database, however, Rayment '298 explicitly states "[T]he database can be built by putting a number of similar vehicles through a test routine where rattles and squeaks are found, their sources identified and their characteristics in terms of position of origin and frequency of occurrence recorded." (Col. 4, ll. 41-44.) In short, the database is built on vehicles having rattles and squeaks, which presumably do not meet "allowable noise level standards." The purpose of the apparatus in Rayment '298 is to allow a quick and accurate determination of the source of a rattle or squeak and allow remedial action to prevent the rattle or squeak from reappearing. (Col. 4, ll. 48-54.) Thus, and contrary to the examiner statement, Rayment '298 uses a list of "previously determined noise sources." (Col. 3, ll. 29-30.)

Claim 4 includes as an element selecting a product that meets allowable noise level standards and measuring a sound level of the selected product. This element is not found in Rayment '298. Nor is this found in the NVH Reduction Trends article cited by the examiner. There must be an apparent reason for combining the cited references; it appears the examiner's reason is that both use a percentage. In short, and this is the only argument that the examiner makes, Rayment '298 teaches calculating percentages for an indication of a likelihood of what causes the particular sound or noise. The examiner fails to point out that the percentages in Rayment '298 are associated with the

mean frequency and frequency range, while NVH Reduction Trends teaches an N10 loudness scale that describes a set of noise measurements wherein N10 is the level reached or exceeded by 10% of the values. Accordingly, it is the examiner's position that since both use a "percentage" a person of ordinary skill in the art would have combined the two teachings.

Despite the examiner's assertions, there is no reason to combine the references. The N10 loudness scale deals with sound levels. It does not address frequencies. The examiner has not set forth any reason why one would combine the N10 loudness scale taught by NVH Reduction Trends with Rayment '298. There is no apparent reason because Rayment '298 does not use sound levels. Accordingly, nothing in NVH Reduction Trends would lead a person of ordinary skill in the art to combine the disclosure thereof with Rayment '298.

A3. As set forth previously, Rayment '298 does not determine the frequency of the vibration induced vehicle noise, nor does it measure the level there of. Additionally, Uhlig '036 does not show that sound level can be determined from the frequency of the noise, since this value is not measured. Neither reference discloses measuring the level of the vibration induced sound and computing an objective metric.

A4. Rayment '298 discloses measurement data based on the operation frequency of a vibration generator and when a vibration induced noise occurs, specifically, the operation frequency of the vibration generator. Rayment '298 does not disclose any information regarding the loudness or sound level of the vibration-induced noise, other than that it must be loud enough for an operator sitting in a vehicle to discern its presence and subjectively conclude that it is loud enough to be a concern;

i.e., "vibration induced noise such as a rattle or a squeak is heard." (Col. 3, ll. 35-36.) NVH Reduction Trends teaches use of a percentile statistical measure to describe a set of noise measurements as a single value, with the N10 loudness scale being a means to measure the loudness of a particular sound. The examiner does not state why one of ordinary skill in the art would use the N10 loudness scale, just that they would. Since Rayment '298 does not utilize sound or noise loudness, nor does it measure the loudness of a particular sound the examiner has provided no apparent reason as to why one of ordinary skill in the art would combine the two references.

A5. Applicants disagree that Rayment '298 performs statistical processing on the saved information. Nothing in the disclosure cited by the examiner supports such a statement. Rayment '298 does not save information related to an objective metric and a threshold metric both of which are based on the sound levels.

B1. Initially, applicants point out that Rayment '298 discloses that when two or more sources have overlapping frequency ranges the apparatus of Rayment '298 stores characteristics of the two noises, displays the identified frequencies graphically and suggests a noise source. (Col. 4, ll. 55-63.) The apparatus suggest a noise source based on the mean frequency, frequency range and occurrence. (Col. 4, ll. 64-65.) The mean and range failures are calculated and placed on a distribution curve to see how closely they fit previously measured data. (Col. 5, ll. 4-6.) Since the mean and range values usually lie off of center, a fit value is calculated in the form of a percentage value. (Col. 5, ll. 9-13.) The occurrence is also expressed as a percentage value. (Col. 5, ll. 13-15.) These three percentages are then combined to yield a final value representing the likelihood that a particular concern is responsible for the noise. (Col. 5, ll. 16-19.) In

addition, the percentages can be weighted prior to being summed together, with the calculated percentage based on the correctness of the identified concern. (Col. 5, ll. 36-38.) Accordingly, Rayment '298 discloses subjecting a vehicle to a frequency of vibration to determine the likely cause of a squeak or rattle occurring in the vehicle. Therefore, even if Rayment '298 establishes an objective metric, it is not based on the sound level, the metric is based on the frequency of vibration to which the vehicle is subjected. Next, the examiner states that the threshold metric corresponds to 10% of the set of the measured values citing NVH Reduction Trends. NVH Reduction Trends discloses percentile measurements used to describe a set of noise measurements as a single value. (¶ 5, page 1 of 3) These measurements are used as an estimate of the subjective loudness of the acoustic offense (¶ 3, page 1 of 3.) Thus, it appears that the examiner is maintaining that the threshold metric is determined based on an N10 loudness scale, which is based on a percentage. The examiner's apparent reason for the combination of Rayment '298 and NVH Reduction Trends is that both use a percentage, which is why one of ordinary skill in the art would use the N10 loudness scale to determine or identify the noise occurring in a vehicle. Applicants submit this is a hindsight line of reasoning, wherein the examiner has seized upon the use of the term percentage or percentile and used it as support for a reason to combine. While NVH Reduction Trends deals with or states that the N10 percentage loudness can be used with squeak and rattle events. Applicants have already acknowledged that a N10 scale can be used as a squeak or rattle descriptor. As set forth in claim 4 the objective metric and threshold metric are based on a N10 loudness scale.

That said, Rayment '298 does not deal or address sound level at all. Rayment '298 is concerned with the frequency at which the vehicle is subjected to not the sound level of the vibration-induced noise. To the extent that Rayment'298 addresses percentage, it is associated with the frequency of the vibration generator, not the sound level or the frequency thereof. In short, the examiner has seized upon a term used in the two cited pieces of prior art, that is, the term percentage or percentile and argues that is the reason for the combination. While both references may use some type of percentage calculation it does not or would not enable a person for ordinary skill in the art to use the N10 loudness scale to determine or identify vibration induced noise occurring in a vehicle as maintained by the examiner.

B2. Contrary to the examiner's statement, the portion of Rayment '298 cited by the examiner does not disclose generating a report providing information relating to repair information. Nothing in the cited portion of Rayment '298 discloses this feature.

B3. Claim 7 includes as an element documenting any diagnosis and repair relating to the product. Nothing in Rayment '298 discloses this claim limitation. While Rayment '298 may disclose building a set of stored data to indicate the frequency at which a particular noise may occur and which may help identify the source of a rattle or squeak, it does not disclose documenting any diagnosis and repair relating to the product.

B4. Nothing in Rayment '298 including the generalized citation to various sections of the disclosure by the examiner discloses using a standardized list of descriptors to document the cause of the noise and necessary repairs to the product. Based on the examiner's previous arguments, it appears that the set of stored data

relating to the cause of the noise is the threshold metric which does not use a standardized list of descriptors to document the cause and any necessary repairs to the product.

B5. As set forth previously in paragraph B2 hereof, the examiner has provided no apparent reason to combine Rayment '298 with NVH Reduction Trends. Further, claim 12 requires a comparison of the objective metric with the threshold metric to determine whether the level of vibration-induced sound occurring in the vehicle is unacceptable. As set forth previously, Rayment '298 does not address sound levels.

B6. The portion of Rayment '298 cited by the examiner, specifically Col. 1, ll. 62-67, discloses building a set of stored data that indicates when a noise occurs at a particular frequency it is likely result from a particular problem. It does not document the diagnosis and repair. It discloses the use of a database against which frequency values are checked. Further, Rayment '298 merely states that upon identification of the source of the rattle or squeak the necessary remedial action can be taken. Nothing in Rayment '298 discloses documenting the diagnosis and repair, claim 13 or inputting into the data acquisition apparatus information pertaining to the diagnosis and repair, claim 15.

B7. Contrary to the examiner's argument, citing Col. 4, ll. 39-48, that Rayment '298 teaches storing vehicle test data in a database, this portion of Rayment '298 discloses building a database using a test routine where rattles and squeaks are found. Once the database is built, subsequent vehicles are compared to the database, wherein the database becomes the standard against which subsequent vehicles are compared. Claim 16 requires saving data relating to each vehicle tested, including the objective

metric, threshold metric and any diagnosis and repair. This data includes data relating to the testing or monitoring of the vehicle, not just the database comparison made in Rayment '298.

B8. As set forth above, Rayment '298 does not disclose saving data relating to each vehicle tested. Rayment '298 provides no disclosure relating to recording or saving data. Instead, it builds a database including vehicle frequency vibration and source of squeaks and rattles and compares subsequent vehicles to that database to determine the most likely concern for the noise occurring in the vehicle.

B9. The examiner has not provided any apparent reason for the proposed combination of Rayment '298, Uhlig '036 and NVH Reduction Trends. The cited portions do not support any type of combination. The examiner's sole reason for the combination appears to be that Rayment '298 teaches using percentages to generate a final value representing the likelihood that a particular concern is responsible for the noise, these percentages based on the mean frequency, frequency range and occurrence and that because NVH Reduction Trends uses a percentage relating to sound levels that these two references should be combined. As set forth previously, the two references have nothing in common other than the word percentage or percentile. One addresses the subjective loudness of an acoustic event and the other addresses the frequency of vibration of a vehicle at which a noise occurs. The examiner neglects to provide a reason why a person of ordinary skill in an art would somehow use the sound level of the noise with the apparatus of Rayment '298.

B10. The examiner's argument that it would have been obvious to use the N10 loudness scale to determine or identify a vibration-induced noise occurring in a vehicle

is an unsupported statement. The examiner has provided no basis supporting why one of ordinary skill in the art, other than the use of the term percentage or percentile in each of the cited references, would somehow combine the two cited references to arrive at applicants claimed invention. Is clear that Rayment '298 monitors the frequency of vibration of a vehicle and correlates that with when the noise starts and stops. The examiner does not say how one of ordinary skill in the art would use the N10 loudness scale to determine or identify a vibration-induced noise occurring in the vehicle just that it would have been obvious to do so. In short, the examiner says that the N10 loudness scale exists and Rayment '298 discloses monitoring a vehicle to determine the source of noise; therefore, it would have been obvious to combine the two. This is a prohibited hindsight rejection. The examiner has done nothing more than attempt to find the various elements and components of the invention in the prior art and argue that it would have been obvious to combine them, without more the rejection must be overturned.

B11. The portion of Rayment '298 cited by the examiner relates to building a database that indicates when a noise occurs in a particular vehicle depending upon the of vibration frequency of the vehicle the noise is likely to result from a particular source. It does not disclose saving data relating to each vehicle tested including the recorded sound level, the objective metric, threshold metric, evaluation and any repair.

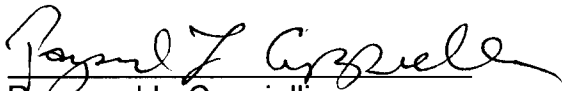
C1. Regarding the rejection of claim 9, the examiner relies on paragraph [0010] of applicants' specification. Paragraph [0010] is part of the Summary of the Invention portion of the patent application. As set forth therein this is one aspect of applicant's

invention. Accordingly applicants submit it is improper to reject the claim is based on the disclosure set forth in the patent application.

Conclusion. For the reasons of record and those set forth above, applicants maintain that the Examiner has not established a prima facie case of obviousness based on the cited references. In particular, the Examiner has not provided any apparent reasons that one of ordinary skill in the art would have been motivated to make the proposed combination. Accordingly, applicants respectfully submit the rejections are in error and request their reversal.

Respectfully submitted,

Attorney for Applicant(s)

By: 

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